# Spectrophotometric Determination of Tantalum in Iron, Steel, and Niobium Metal

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**Abstract**

A procedure for the determination of small amounts of tantalum in iron, steel, and niobium metal is described. Tantalum forms a complex salt with malachite green in the presence of hydrofluoric acid, and this salt is extracted with benzene or xylene. Usually boron is the only element present in the sample which undergoes a color reaction similar to that of tantalum, and it can be removed easily by fuming with sulfuric acid to volatilize it as boron trifluoride. After dissolution of the sample with sulfuric acid, the solution is diluted with ammonium oxalate solution. Hydrofluoric acid is added to a part of this solution, the sulfuric acid concentration is adjusted to about 0.1N with sodium hydroxide, and malachite green is added. The complex salt is extracted with benzene, and tantalum is determined by measurement of the absorbance of the benzene layer at 635 m$\mu$. From 0.005 to 0.5 per cent of tantalum can be determined with good accuracy without any preliminary separation of tantalum. This method should also be applicable to somewhat wider range (from 0.001 to 5 per cent) of tantalum.

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